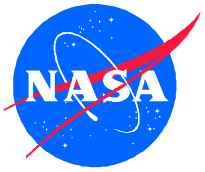


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PDR**

**3.4.2
Data Storage**

HWC1 3.4.2 Hard Disk Assembly

- Requirements Traceability
 - DTRD section 3.4.2.1
 1. All data and commands received by the flight processors shall be stored on-board.
 2. The required amount of storage shall be 10 GB. It is desired to provide 50 GB of storage.
 3. A separate, independent data storage subsystem shall be provided for each flight processor.



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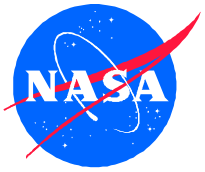
**3.4.2
Data Storage**

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Code 584W
November 4-5, 1998

HWCI 3.4.2

Hard Disk Assembly

- Trade Studies
 - Solid State Memory
 - Cost prohibitive
 - Magnetic Tape Drive
 - Concern with mechanical failure and durability of tape
 - Flash Memory
 - Could not meet storage requirement
 - Optical Disk Drive
 - Could not meet storage requirement
 - Hard Disk Drive
 - Flight proven
 - Meets storage requirement

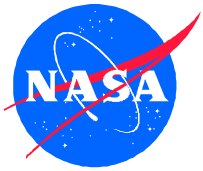


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**3.4.2
Data Storage**

HWC1 3.4.2 Hard Disk Assembly

- Functional and Performance Requirements
 - 3.4.2.a. - Store all data and commands received by the flight processors.
 - 3.4.2.b. - Meet the required amount of storage.
 - 3.4.2.c. - Provide a separate, independent data storage subsystem for each flight processor.
 - 3.4.2.d. - The item shall operate in the flight environment



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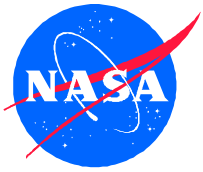
3.4.2
Data Storage

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HWCI 3.4.2

Hard Disk Assembly

- HWCI Description
 - **Mechanical**
 - Dimensions – Height (inches, mm): 1.62/41.1
 - Width (inches, mm): 4.00/101.6
 - Depth (inches, mm): 5.75/146.1
 - Mass (lbs / kg): 2.2/0.99
 - Connectors: SCSI Cable Connector, Terminator Power Plug



ULDB
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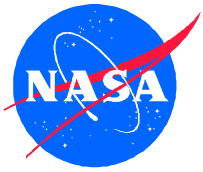
3.4.2
Data Storage

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HWCI 3.4.2

Hard Disk Assembly

- HWCI Description
 - **Electrical**
 - Operating Voltage(s):
 - Hard Drive: +5 volts / +12 volts
 - Power consumption – Typical (Watts seek / read):
20.85
 - Idle (Watts): 13.35
 - Data Format(s): SCSI Interface
 - Other Performance Specifications:
 - 18.21 Gbyte formatted capacity
 - External Transfer Rate (mbyte / sec): 20
 - Average Access (ms) read / write: 7.9/8.7
 - Max Full Seek (ms) read / write: 16/18



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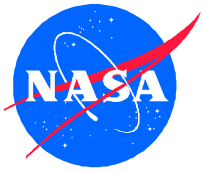
3.4.2
Data Storage

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HWCI 3.4.2

Hard Disk Assembly

- HWCI Description
 - **Environmental**
 - Temperature:
 - Operating: +5°C to 50°C with maximum temperature gradient of 20°C per hour
 - Non-operating: -40°C to 70°C with maximum temperature gradient of 25°C per hour
 - Altitude:
 - Operating: -1000 to +10000 feet
 - Non-operating: -1000 to +40000 feet
 - Vibration (Bels typical, sound power): 4.2
 - Shock (G's, 11 / 2 ms):
 - Operating (Read / Write): 5
 - Nonoperating: 50 / 135



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**3.4.2
Data Storage**

HWC1 3.4.2 Hard Disk Assembly

- Risk Assessment & Mitigation/Reliability
 - Previous Flight History
 - Hard Drives have flown successfully on Long Duration Balloon Projects
 - COTS